

CLAIMS

1. Recombinant multimeric protein, characterized in that it comprises at least:

- a) a polypeptide fusion molecule A, which consists of a C-terminal fragment of the  $\alpha$  chain of C4BP, contained between amino acids 124 and 549, and a polypeptide fragment which is heterologous in relation to said  $\alpha$  chain,
- b) a polypeptide fusion molecule B, which consists of a C-terminal fragment of the  $\beta$  chain of C4BP, contained between amino acids 120 and 235, and a polypeptide fragment which is heterologous in relation to the  $\beta$  chain,

with the molecules in a) and b) being linked in their C-terminal moiety in order to form said multimeric protein.

2. Recombinant multimeric protein according to Claim 1, characterized in that the C-terminal fragment of the  $\alpha$  chain is contained between amino acids 493 and 549, and in that the C-terminal fragment of the  $\beta$  chain is contained between amino acids 176 and 235.

3. Recombinant multimeric protein according to Claim 1 or 2, characterized in that the ratio of the number of monomers  $\alpha/\beta$  varies between 7/1 and 5/3 and is preferably 7/1.

4. Recombinant multimeric protein according to one of Claims 1 to 3, characterized in that the heterologous fragments in A and in B are derived from specific ligands of the immune system, in particular derived from lymphocyte surface proteins of the CD type, from antibodies or antibody fragments, or from antigens or antigen fragments.

5. Recombinant multimeric protein according to Claim 4, characterized in that the fragments derived from lymphocyte proteins are CD4, CD8, CD16 and CD35 (or CR1).

6. Recombinant multimeric protein according to Claim 4, characterized in that the antibodies or antibody fragments have an anti-Rh(D) specificity.

7. Recombinant multimeric protein according to Claim 4, characterized in that the antigens are vaccinating antigens.

5 8. Recombinant multimeric protein according to one of Claims 1 to 3, characterized in that the heterologous fragment in A is a therapeutic enzyme.

9. Recombinant multimeric protein according to one of Claims 1 to 3, characterized in that the polypeptide fusion fragments contain:

10 - in A, CD4 or a derivative of CD4, and;  
- in B, the scFv of an antibody, in particular a neutralizing antibody or an anti-Rh(D) antibody.

10. Recombinant multimeric protein according to one of Claims 1 to 3, characterized in that the polypeptide fusion fragments contain:

15 - in A, an antigen, in particular a vaccinating antigen, or a therapeutic enzyme or a CD35 (or CR1) or an antibody, or any fragment thereof which possesses the ligand property of the whole molecule,  
- in B, an antibody or a fragment thereof which has retained its epitope.

20 11. Recombinant multimeric protein according to one of Claims 1 to 3, characterized in that the polypeptide fusion fragments contain:

25 - in A, a vaccinating immunogen, and  
- in B, a CD4 or a derived molecule, provided that it retains the ligand property of the whole molecule.

12. Prokaryotic or eukaryotic cells, characterized in that they have been transduced with one or more 30 plasmids containing a heterologous nucleic acid sequence which encodes at least one polypeptide fusion molecule A and one polypeptide fusion molecule B.

13. Cells according to Claim 12, characterized in that the cells have been either,

35 - cotransduced with two separate plasmids, or  
- transduced with a first plasmid encoding a first polypeptide and then supertransduced with the second plasmid encoding the second polypeptide, or

- result from the fusion of two cells, one of which has been transduced with a plasmid encoding the first polypeptide while the other has been transduced with a plasmid encoding the second polypeptide.

5 14. Cells according to one of Claims 12 or 13, characterized in that the first plasmid is that which was deposited in the C.N.C.M. under No. I-1610 on 12 July 1995, and the second plasmid is that which was deposited in the C.N.C.M. under No. I-1611 on 12 July  
10 1995.

15. Process for preparing a multimeric protein as defined in any one of Claims 1 to 11, characterized in that it comprises at least the following steps:

- transducing target cell lines with at least one plasmid, each of which contains a heterologous sequence which respectively encodes an A chain or a B chain according to any one of Claims 1 to 11,
- expressing and isolating the heterologous A and B chains,
- 20 - placing said polypeptides, in specific proportions, in an oxidizing medium,
- isolating the multimers.

16. Process according to Claim 15, characterized in that the transduced lines have been either:

- 25 - cotransduced with two plasmids carrying DNA sequences which respectively encode the A and B polypeptides, or
- supertransduced with two plasmids, which two plasmids carry DNA sequences which respectively encode  
30 the A and B polypeptides, or
- result from the fusion of cells which have, respectively, been transduced with a plasmid carrying a DNA sequence which encodes the A polypeptide and with a plasmid carrying a DNA sequence which encodes the B polypeptide.

35 17. Use of a recombinant multimeric protein according to any one of Claims 1 to 11 for producing a medicament which is intended for preventing foetomaternal alloimmunization.

18. Use of a recombinant multimeric protein according to any one of Claims 1 to 11 for producing a medicament which is intended for the therapy or prophylaxis of viral, bacterial or parasitic infections.

19. Use of a recombinant multimeric protein according to any one of Claims 1 to 11 for producing a medicament which is intended for the therapy of autoimmune diseases, in particular disseminated lupus erythematosus.

20. Use of a recombinant multimeric protein according to any one of Claims 1 to 11 in a diagnostic test which requires the intervention of at least two different ligands.

21. Pharmaceutical composition, characterized in that it comprises, as the active principle, a multimeric protein according to any one of Claims 1 to 11, with said pharmaceutical composition enabling the immunotherapy or the immunoprevention of pathologies which are linked, in particular, to viral or bacterial infections or to autoimmune or alloimmune diseases.

add b4

add  
C4